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ABSTRACT

This publication provides an overview of the nutrition needs of five population groups: preschool and elementary school-age children, adolescents, adults, athletes, and persons with special nutritional and educational needs (including those with problems of overweight, sugar and salt consumption, and food allergies). Goals and learning experiences appropriate for helping meet these needs are suggested, and several resources for teachers of and learners in each of the groups are listed at the end of each section. (MP)

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Techniques for Meeting Nutrition Education Needs

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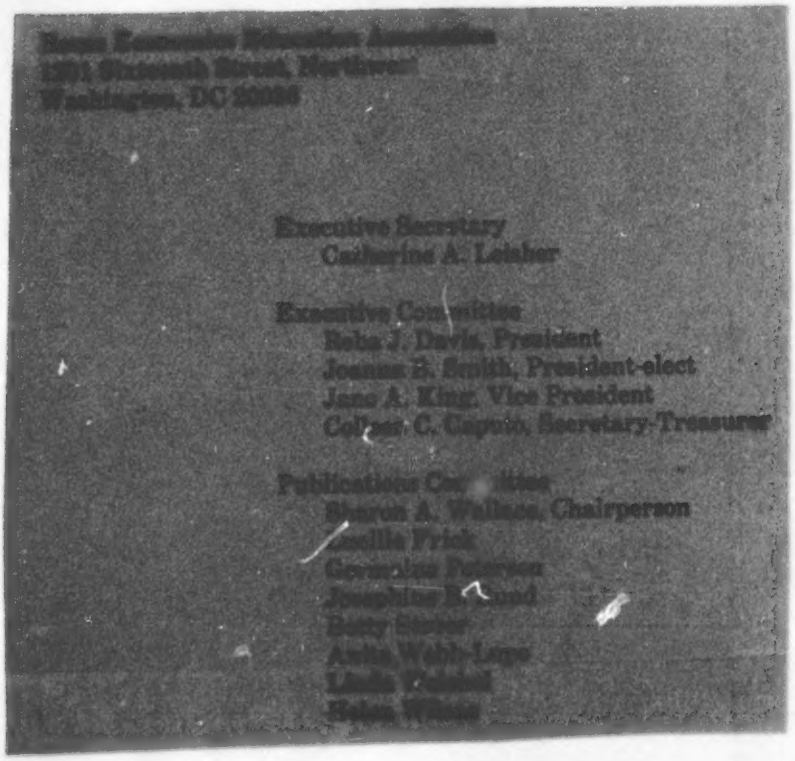

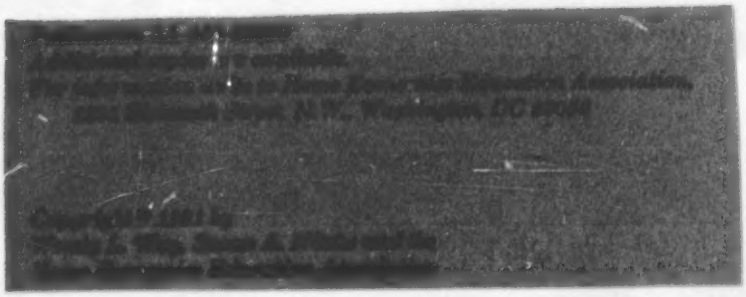

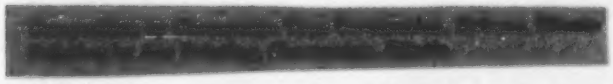

Foreword

Human nutrition has gained increased public attention in our society in recent years. Since we have known for a long time that "telling is not teaching," home economics educators have innovated many techniques for involving a learner with the subject matter of nutrition.

Nutrition kindles a fascination in many people because of its direct relationship to personal health. Others, particularly home economists, see nutrition as the one segment of their subject matter which can be quantified with reasonable research support. For example, the National Research Council agrees that for normal persons, a specific amount of iron is needed for certain age, sex groups. Yet, who can say how much love is needed, even though we know it is needed by everyone who becomes self-actualized.

Way and Nitzke have approached nutrition education from the special groups perspective. This publication is prepared to identify reliable sources for nutrition content, but its major focus is on the needs and learning activities for preschool and elementary children, adolescents, adults in several sets of circumstances, and athletes. We are grateful to these authors for their many insights and their ability and willingness to share their ideas in this way.

This treatment of nutrition education should be appropriate to home economics teachers, coaches, special education teachers, health educators, and to many community agency human service professionals. If the user has academic preparation in nutrition, the resources and references may be familiar. If the user does not have academic preparation in nutrition, the resources will be especially important. If you find yourself needing to teach your group something about nutrition and do not have the academic preparation you wish you had, please feel free to ask a home economist to help you.

The Executive Committee and Publications Committee of the Home Economics Education Association are proud to place Techniques for Meeting Nutrition Education Needs in the hands of members as we strive to improve the quality of home economics education. We hope you will share it with appropriate professionals in your community.

Happy Reading and Teaching

Reba J. Davis

Reba J. Davis
President 1979-81

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I. Introduction to Nutrition Education

Nutritional Status in the United States

In the midst of an abundant food supply, Americans face many nutrition related problems. Obesity, dental caries, and anemia are nearly endemic and largely attributable to dietary factors. In addition, cardiovascular disease, cancer, and diabetes are major causes of death in our country and each is affected in incidence or severity by eating habits. Nationwide surveys have repeatedly shown that eating habits could be improved in our country, especially among groups such as the poor, the elderly, Indians, Eskimos, and migrant workers.

As lifestyles have been changing in the 20th century, so too have our eating patterns. Nationwide consumption of breads, cereal products, and potatoes has declined consistently throughout this century. Although the consumption of sucrose (table sugar) has not changed much over the years, the total consumption of nutritive sweeteners has increased. Thus, our overall carbohydrate consumption has tended to consist more of refined sugars such as corn syrup and less of the complex carbohydrates (starch) and dietary fiber or "roughage." Meat has become an increasingly prevalent part of the U.S. meal pattern with Americans tending to consume more animal protein and fat than in 1900.[1] This is a source of concern among the scientists who believe that heart disease and certain cancers can be promoted by over consumption of animal products.

The Health and Nutrition Examination Survey (HANES),[2] conducted in 1971-72, is the most comprehensive source of dietary statistics currently available in the U.S. Iron intakes were found to be most often short of recommended standards, especially among infants, adolescents, and women of childbearing age. Energy and protein intakes tended to be low among the elderly and poor. Calcium intakes were frequently less than recommended levels for black women, and vitamin A intakes were frequently less than recommended for adolescents. Thiamin (B_1), riboflavin (B_2), and ascorbic acid (C) intakes were generally adequate.

The Ten State Nutrition Survey of low income areas in 1968-73[3] reported anemia to be a common problem, especially in the South, among Blacks, and in the lowest income groups. Serum levels of vitamin A were often low for children under 5, especially in Texas. Ascorbic acid intakes were often below recommendations, especially in the South. Mexican-American children were markedly below average in height and weight for age, and obesity was prevalent among Black women.

The Nationwide Food Consumption Survey,[4] conducted by the U.S. Department of Agriculture (USDA) in 1977-78, revealed that many individuals, especially young women, had low intakes of calcium, iron, magnesium, and vitamin B^6. When compared to previous surveys, reported consumption of calories was lower, though vitamins and minerals except calcium were nearly the same. Since Americans are not thinner than before, the survey suggests we are generally less active but are consuming food with a higher nutrient density.

Federal Programs

The White House Conference on Food, Nutrition, and Health in 1969 provided a forum for discussion of nutritional problems in the United States and focused attention on the need for more and improved nutrition education. Until that time, USDA's Cooperative Extension Service, the National School Lunch program, enrichment requirements for certain foods, commodity distributions, and ingredient labeling regulations were the only major

federal programs with nutrition components. Since then, there have been many new programs such as the Special Supplemental Food Program for Women, Infants, and Children (WIC), School Breakfast, the National Nutrition Education and Training Program (N.E.T.), Child Care Food Program, Food Stamps, and Congregate Meals for the Elderly. Most of these programs have a required nutrition education component.

In 1971 the Food and Drug Administration began extensive revisions of food labeling regulations with nutrition labeling as the cornerstone of the new approach. Foods which have nutrients added and all foods that are advertised or labeled with a nutrition claim must show detailed nutrient information in a precise format. More recently, expanded regulatory actions have been proposed including requirements for more complete ingredient information, open dating, and fortification policies.

Scientific estimates of nutrient needs are periodically up-dated by the National Academy of Sciences Food and Nutrition Board in the form of Recommended Dietary Allowances (RDA's). The RDA's are given for 17 specific age/sex groupings and are designed for the maintenance of good nutrition of practically all healthy people in the United States.[5] The U.S. RDA's that are used for nutrition labeling are based on the 1968 RDA's and give a generous estimate of nutrient recommendations for persons over four years old.[6]

In 1977-78, the Senate Select Committee on Nutrition and Human Needs published and later revised a comprehensive set of Dietary Goals urging Americans to drastically reduce consumption of sugar, salt, saturated fat, and cholesterol.[7] In 1979 the U.S. Department of Health, Education and Welfare (HEW) published *Healthy People: Surgeon General's Report on Health Promotion and Disease Prevention,*[8] and in 1980 a set of seven Dietary Guidelines for Americans was published jointly by USDA and HEW.[9] These guidelines urge us to: 1) eat a variety of food; 2) maintain ideal weight; 3) avoid too much fat, saturated fat, and cholesterol; 4) eat foods with adequate starch and fiber; 5) avoid too much sugar; 6) avoid too much sodium; and 7) drink alcohol in moderation, if at all. These seven guidelines will provide a foundation for government education efforts in the future.

Even so, *Toward Healthful Diets,*[10] a 1980 publication of The National Academy of Sciences Food and Nutrition Board, criticizes the dietary recommendations, especially those for fat and cholesterol. This report claims that there is not enough direct scientific evidence to justify such efforts to change dietary patterns for the general population.

In 1978, the Presidential Commission on World Hunger was formed to analyze problems and to recommend government actions to alleviate undernutrition on this planet. After careful study, the committee released a series of reports on this subject.[11] These reports will be used to formulate government policy on food aid and other forms of assistance to developing countries.

Evaluating and Selecting Resources for Nutrition Education

A myriad of informative/educational materials exist which purport to present facts about nutrition. Unfortunately, many of them contain misleading or inaccurate information. Some classroom materials contain accurate information but are used to promote certain products which may not be in the students' best interest.

It is difficult to judge the value of any material without personally examining both content and format. Fortunately, there are reviews available which give annotated descriptions of materials. These reviews can be the basis for screening to determine which ones are worth more thorough individual examination. *The Journal of Nutrition Education* and *The Journal of the American Dietetic Association* contain such reviews.

The Society for Nutrition Education[12] publishes a bibliography of audiovisual materials for nutrition education and pamphlets on nutrition information resources. The Food and Nutrition Information and Educational Materials Center[13] assembles and lends a comprehensive collection of books, articles, and audiovisual materials related to food service and nutrition and publishes catalogs with abstracts and descriptive data. There is also a Nutrition Information and Resource Center at Pennsylvania State University[14] which provides assistance in identifying and selecting reliable nutrition information and educational materials.

Local professionals can also provide assistance in selecting resources. Most states have a Nutrition Education and Training Program (NET) which hires nutritionists to promote nutrition education in the schools. The local or state chapter of The American Dietetic Association may also be able to provide assistance as well as the county or state office of The Cooperative Extension Service. In addition, The National Dairy Council, a nonprofit research and educational organization of the dairy industry, and its affiliated Dairy Council units provide a wide range of materials and assistance for nutrition education.[15]

The final judgment as to whether a particular item is appropriate must be made by the teacher who decides if the information fits the goals he or she is hoping to achieve. Besides accuracy, the audience's level of knowledge, the cost, the availability, the length, and the style of presentation are all important factors to be considered.

Note: For educators wishing to update their knowledge independently, several general nutrition references are provided in the bibliography at the end of this section.

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[12]National Nutrition Education Clearing House, Society for Nutrition Education, 2140 Shattuck Ave., Suite 1110, Berkeley, CA 94704, (415) 548-1363.

[13]National Agricultural Library Building, Room 304, Beltsville, MD, 20705, (301) 344-3719.

[14]Beecher House, University Park, PA 16802, (814) 865-6323.

[15]National Dairy Council, 6300 North River Road, Rosemont, IL 60018, (312)696-1020.

II. Preschool and Elementary School Age Children

NEEDS

Childhood is a period of rapid physical growth during which nutrients are needed by the body for manufacturing new tissue. For this reason, the quality and quantity of food consumed in childhood are very important; more important, usually, than at any other time in life.

Dental health is also affected by a child's eating patterns. The types of food eaten, the frequency of consumption, and the amount of time food residues remain in contact with tooth surfaces are important determinants of caries development and gum disorders.

The innate preference of children for sweet tastes[1] and their common dislike for many vegetables make it more difficult to provide a nutritious diet just at the time when nutrient intake is so important. In addition, children in the United States often get less iron, vitamin A, and vitamin C than they need, compounding the problem even further.[2]

The attitudes that children form about food and eating begin in infancy and are firmly established by the time a child reaches school age. Overfeeding an infant, using sweets as rewards, and making Mom or Dad happy by "cleaning your plate" are some examples of the practices involved in this habit and attitude forming process. As a child grows older, established eating patterns may be reinforced or altered by experiences such as peer group pressure and persuasive advertisements.

Television programs and commercials are particularly powerful factors which must be recognized and addressed by nutrition educators. Elementary school-age children watch an average of 21 hours of television per week (four hours of advertising)[3] and the advertised products are almost always highly sugared, high in salt, high in fat, or over-refined, making them relatively undesirable if they become a major source of calories.

The complex task of providing all necessary nutrients in proper amounts at the time they are needed is the general rationale behind recommending a balanced diet. This broad goal is the source of simple and familiar pieces of advice such as "breakfast is the most important meal of the day," "don't eat too much candy," and "drink four glasses of milk every day." Such messages can be appropriate parts of a nutrition education plan, but a strictly "preachy" approach to nutrition education can have negative concomitant or incidental results.[4]

Nutritional needs of preschool and elementary school-age children can be addressed in at least two ways by persons involved in providing formal nutrition education. First, learning experiences related to eating behaviors can be designed and implemented for children themselves in day care, preschool, or public school settings. Furthermore,

persons who have or will have responsibility for caring for children (e.g., prospective parents and babysitters) can be prepared to select nutritionally adequate food for children and to consciously design experiences for children which will encourage positive attitudes toward food and good eating habits.

The goals and suggested learning experiences which follow are divided into two categories appropriate for preschool and elementary school-age children. The activities are designed to be used directly with children or in training persons involved in caring for them. Many of these might, for example, be integrated into the activities of a preschool organized as part of a junior high or high school home economics class or into a babysitting unit of a related program. Many might also be used as part of a Future Homemakers of America (FHA) Chapter project dealing with young children.

LEARNING EXPERIENCES

Goal #1—To help children become aware of the many types of food available.

Preschool

- Take a field trip to a farm or an outdoor market. Discuss where different types of foods come from. Follow by playing a game to see how many different foods can be named.
- Start a vegetable garden in the classroom. As the vegetables grow, discuss how these foods eventually become the types of things we eat. Follow by comparing foods grown at school with those seen growing other places (e.g., at home, in the country).
- Organize a series of puppet shows, perhaps depicting types of foods in various food groups: 1) Vegetables on Parade featuring Linda Lettuce, Betty Beet, Carol Carrot, Cathy Cabbage, Gary Green Bean, Timmy Tomato; 2) Meaty Matters featuring Bobby Beefsteak, Polly Pork Sausage, Edith Egg, Lucy Liver, Charlie Chicken; 3) Breads Ahead featuring Ronnie Roll, Sylvia Spaghetti, Willie Wheat, Rollie Rye, Marcie Macaroni; 4) Milk Mates featuring Ida Ice Cream, Connie Cheddar, Susan Swiss, Yarlene Yogurt, Patty Pudding. Compare similarities and differences in the foods illustrated.

Elementary

- Play "The Village of Food." First make village houses for each of the food groups out of cardboard boxes and decorate with pictures or drawings. Then have a treasure hunt to find food to fill the appropriate houses. ("Foods" associated with the food groups could be real items, pictures of them, cloth or paper models, or food models available from The National Dairy Council.) Follow by identifying other familiar foods not represented in the game.
- Take a field trip to a supermarket. Identify the many forms in which food is available (e.g., orange juice as fresh oranges, frozen concentrate canned concentrate, canned and bottled juice). Discuss which forms of foods are eaten at home or school. Follow up by tasting, if possible.

Goal #2—To help children develop a willingness to try new foods.

Preschool

- After learning about the variety of foods available, have students help in the preparation of some simple nutritious foods: biscuit pizzas, fresh-squeezed orange juice, cracker or bread sandwiches, fruit salad, vegetable salad, yogurt, tuna salad, celery stuffed with peanut butter or cheese spread, popcorn, fruit juice punch, bean or alfalfa sprouts, deviled eggs. After tasting, identify new foods that tasted good.
- Play "See How Many I Can Try." During each session that children meet, have a variety of new foods available for them to try at lunch or snack time (interestingly prepared in small portions). Keep large colored charts depicting how many new foods each child has tried.

Elementary

- For students who eat school lunch, have them keep track of the new foods they try at school. Give stars on colored posters for each new food.
- Enlist the help of parents in recording new foods tried at home or in a restaurant or during other family outings. Post results at school, if possible.

Goal #3—To help children recognize television advertisements as product promoters.

Preschool

- Arrange to watch early morning or Saturday television with the children. Then discuss how one can tell the difference between those parts of TV that are selling (making you want to eat or buy

something) and those that are just for entertainment.

Elementary

- After watching television advertisements, discuss the following:
  a) What things do the ads do to make you want to buy the foods shown? (Promote a celebrity, offer a free prize, make you think you will have more friends or a better time?)
  b) What words are used in TV ads to make the food products sound good? (Richer, crunchier, moister, chewier, smoother, new?) Identify impressive-sounding words for which meanings are not known.
- Have students create a skit to advertise a food product. Identify and analyze the techniques used to try to make others want to buy it.
- After watching television advertisements or skits illustrating them, pretend you have only $1.00 to spend for food for one day. Discuss which advertised food products you would buy and which you would not and why.
- Conduct taste tests of different brands of food advertised on television (e.g., peanut butter, types of cereals). Discuss differences between perceived and actual tastes.

Goal #4—To help children develop ability to differentiate between "empty calorie" foods and foods which are high in nutrient density.

Preschool

- Tell an illustrated story or hold a puppet show based on the theme, "Tops and Robbers in Snacks." Illustrate which types of snack foods are "tops" in nutrients (e.g., vegetables, fruits, nuts, raisins) and which are "robbers" (e.g., potato chips, candy, gum, soda pop).
- Follow an illustration of "empty calorie" foods and foods of high nutrient density with a grab-bag strategy where different kinds of foods are identified as "robbers" of nutrients and sent to jail or "tops" in nutrients and given gold deputy badges.

Elementary

- After presenting information about the basic types of nutrients (proteins, fats, carbohydrates, vitamins, and minerals), perhaps in an illustrated story format, hold an "Ask Andy" session to discover the nutrient content of various kinds of foods. Prepare "Andy" to answer questions as follows: 1) Cut a life-sized child figure from cardboard or butcher paper and decorate appropriately; 2) Cut the stomach or middle section out of the figure; 3) Prepare colored graphs the size of the cut-out middle section that illustrate the percentages of RDA's supplied by a variety of common foods (e.g., hot dogs, hamburgers, fruits, vegetables, pop, potato chips). There should be one graph for each food. (The National Dairy Council's comparison cards may be adapted for this purpose.) These graphs can be made to appear in Andy's "stomach" when asked questions such as "What nutrients will Andy be getting if he drinks a can of soda pop?" Follow by summarizing differences and similarities in nutrients supplied by the various foods Andy might choose to eat.
- Use a Dear Abby or case study story to suggest a nutrition problem children might be having (e.g., Johnny and his family overslept. What could they prepare quickly for breakfast that would be good for them?; Sally is hungry when she gets home from school. What would be good for her to eat?). Develop solutions to the problems and discuss reasons for them.

Goal #5—To help children see the relationship between food, exercise, and body weight.

Preschool

- Collect sets of pictures depicting a) children engaged in various levels of physical exercise (e.g., sitting, running, jumping, walking), b) people of various weights, and c) various amounts of foods. Use the pictures on a corkboard or magnetic board to illustrate in turn the relation between a) calorie needs and amount of physical activity, b) calorie intake and weight, and c) exercise and weight. Follow with a "What if" question and answer session (e.g., What would Julie look like if she played very hard every day but ate very little? What would happen if Julie never exercised but nibbled on rich foods all the time?).

Elementary

- For higher-grade elementary-aged children, following an introduction to diet, exercise, and

weight, play a variety of Nutrition Rummy as follows: Prepare a deck of cards with at least 63 cards illustrating in equal numbers a) various foods with high, medium, and low calorie designations, b) various levels of exercise (e.g., running, walking, swimming) and c) various body weights (e.g., thin, average, heavy). To play, deal six cards to each player. The dealer then draws one card and discards a card from his/her hand. Play continues as players try to make matched sets of three cards: food calorie level, exercise, and weight. Examples of possible combinations include 1) high calorie, low exercise, heavy, 2) low calorie, low exercise, average and 3) high calorie, high exercise, average. Summarize by discussing the different ways calorie intake and exercise level can be combined to produce similar and different weights.

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[3]Federal Trade Commission. *Staff Report on Television Advertising to Children.* Federal Trade Commission, Washington, DC, 1978.

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III. Adolescents

NEEDS

When a child matures and passes through puberty, there are many physical and emotional changes which can affect nutritional status. As the child becomes more independent, he or she consumes an increasing proportion of food away from home and so away from the influence of parents. Skipping meals, snacking, and fad dieting are common in the teen years. Social aspects of eating are very important, peer pressure is a strong motivator, and long-term health concerns are often ignored by adolescents.

Nutrient needs are high in adolescence, especially during the "growth spurts" which are characteristic of this age group. Menarche causes iron requirements to increase in young women, and anemia becomes a common condition in teenage girls, especially those who are frequent dieters. Almost all recent dietary studies of adolescents have revealed, furthermore, that nutrients often below Recommended Dietary Allowance (RDA) in this age group are calcium, vitamin A, and vitamin C.

Young women who become pregnant before their own growth is completed have even higher nutrient needs than their non-pregnant peers. Unfortunately these needs come at a time when nutrient stores in the body may have been depleted by poor eating habits. The problem can become especially critical if the pregnant teenager restricts her food intake hoping her condition will not show early. Babies born to teenage mothers are more often premature and have more complications than average, so the teenager is considered a poor obstetrical risk.

The principles of weight control are especially important for teenagers to learn. About one-third of adolescents are overweight and those who are physically inactive are especially prone to obesity. Fad diets and eating "binges" often accompany the emotional stresses of this self-conscious period. Anorexia nervosa, a compulsive fear of obesity which leads to emaciation and sometimes even fatal starvation, is a condition which occurs almost exclusively in teenage and young adult females and requires professional psychological as well as physiological treatment.

Nutrition education is important for teenagers not only because of their high nutrient needs and common eating problems but also because eating habits which are set at this time will likely be passed on to the next generation as they become parents. Teaching methods should be based on realistic expectations and focus on existing eating habits. Good habits should be reinforced and poor ones modified to move toward improved overall patterns. For instance, snacking can make positive contributions to the whole day's supply of nutrients if foods are selected carefully, so teenagers should know what to look for in choosing foods from vending machines and fast-food restaurants.

The desires for good looks, popularity, vitality, and athletic accomplishments are typically high in adolescents and can serve as powerful motivators in providing nutrition education. It is especially important that planned activities give accurate nutrition information, correct false impressions caused by misleading information in popular books, magazines, and on television, and help the teen recognize misinformation in future encounters.

In many public secondary schools, formal nutrition education may take place exclusively within the home economics program. Many opportunities exist, however, to increase the number of professional educators and support staff involved in teaching nutrition. The school nurse, for example, might well make a major contribution as might the health teacher, physical education teacher, biology teacher, and school food service personnel. The possibilities for team teaching with the leadership from the home economics teacher are unlimited.

Nutrition education for adolescents need not be confined to what can take place within regular class

scheduling. For example, parent involvement might easily lead to expanded learning at home. In addition, Future Homemakers of America (FHA) involvement might lead to increased awareness at school among other students.

Some sample goals and activities which incorporate these and other ideas follow. The reader will note that ideas for FHA and HERO projects are specifically identified in some of the suggested activities. Many others may also be adapted for this use, however, depending upon the background and interests of both chapter members and advisors.

LEARNING EXPERIENCES

Goal #1—To help students identify factors which affect eating habits.

- Use a word association activity to clarify present feelings and attitudes toward food. For example: Given a list of words such as fat, thin, fun, depression, hunger, boredom, ball game, home, movie, cavities, muscles, acne, select the one most associated with various kinds of foods depicted in a food collage or shown as food models or real foods (e.g., hamburger, cottage cheese, turkey dinner, popcorn, candy bar, hot dog). Follow by discussing a) ways in which eating habits are often determined by factors other than humger (e.g., emotions, events, desires related to physical appearance), b) perceptions about qualities of various foods (e.g., fattening, muscle-building) that may or may not be true, and c) reasons for differences among individuals in associations.
- Organize a class research project to identify eating habits of other students at school. The class might divide into groups to develop and administer questionnaires related to: a) number of students who do and do not eat breakfast, what breakfast consists of, and reasons for eating or not eating, b) frequency of snacking, times snacking occurs, and foods consumed as snacks, c) number of students who do and do not eat school lunch, which of the foods they prefer or do not prefer and why, attitudes toward lunchroom atmosphere and time of lunch, d) number of students on a weight reduction or gaining diet, perceptions about amount and types of food appropriate. Tabulate results and discuss by summarizing the various factors which affect eating habits and the possible long-term effects of the more common habits. If desired, develop a plan for changing one or more negative food habits as an FHA Encounter project. Evaluate progress at regular intervals.
- After exploring factors which affect eating habits, organize an FHA activity around identifying factors at school that may negatively affect these habits. Develop a plan, perhaps including peer teaching, for correcting one or more of the problems and enlist the help of other students in carrying it out. Summarize results later at a school assembly or in an article prepared for the school newspaper.

Goal #2—To help students analyze the relation between diet, health, and appearance.

Focus: Weight Control

- Working alone, make two lists of foods: those felt to be fattening and those felt not to be fattening. Share ideas as a class. Then divide into groups to look up calories contained in typical portions of the foods.[1,2] Discuss misconceptions about foods (e.g., calories contained in a slice of bread generally considered "fattening" versus calories contained in a second halping of meat, calories contained in two tablespoons of peanut butter versus those in a potato). Revise lists of fattening and non-fattening foods. Develop some generalizations about calorie values of foods (e.g., fried foods contain more calories than baked or broiled, whole-milk products more than skim). Follow up by differentiating between calories and nutrients and weight and fat by comparing energy versus nutrient values of food and by looking at energy expenditures of various kinds of physical activities.[3]
- For students and/or teachers who wish to participate, sponsor a diet and exercise clinic, perhaps in cooperation with the school nurse and physical education teacher or class. To prepare for the operation of the clinic, develop some sample calorie-controlled menus which provide nutritionally adequate food intakes for teenagers and adults and that are likely to be acceptable in terms of food likes and dislikes, levels of activity, and family meal patterns. Then, develop one or more brochures giving diet and exercise tips (e.g., foods to avoid, energy expenditure and exercise suggestions, snack suggestions, psychological helps) and/or provide a regular column in the school newspaper. A weekly counseling service (perhaps before school, during lunch, or after school) might also be set up (with confidential

weigh-ins, if desired) along with a "buddy-system" or "sweet tooth hot line" and exercise sessions. Evaluate progress periodically by keeping charts (perhaps anonymously numbered) of inches and/or pounds lost. If desired, this activity might be expanded into a team-taught unit or course lasting several weeks and/or taken on as an FHA project.

Focus: Dietary Misconceptions

- Hold a class brainstorming session to identify a) health and appearance problems that are sometimes associated with diet (e.g., acne, tooth decay, colds, heart disease) and b) claims sometimes made for certain nutrients and/or dietary patterns (e.g., organic foods, vegetarian diets, vitamin supplements). Divide into groups to investigate each and prepare to hold a series of class or school information sessions including any combination of the following: one or two dermatologists to discuss the relation or lack of relation between acne and specific foods, a debate on the relation between vitamin C and the common cold, a panel to discuss the pros and cons of eating eggs every day, a debate on the merits of vegetarian diets or a verbal analysis of the dietary contributions of organic foods and dietary supplements (e.g., concentrated protein supplements, vitamin E).

Focus: Anorexia Nervosa

- Contact one or more pediatricians to speak to the class about the condition known as anorexia nervosa, specifically, what causes it, whom it afflicts, what the symptoms are, and what the long-range effects are. Follow up by initiating a poster campaign to alert fellow students to the problem and where they can go for help.

Focus: Teenage Pregnancy and Nutritional Status

- After reading an overview of the special nutritional needs of pregnant teenagers,[4] compare with the "normal" nutritional needs of teens, perhaps in the form of a graph comparing Recommended Dietary Allowances of the two populations. Then, divide into groups to develop suggested food plans which would meet nutritional needs of a pregnant teenager under the following circumstances: a low food budget, two of three meals a day eaten away from home, weight gain recommended. Share results in a class discussion focusing on justification of food selections as well as the relation between long-term eating habits and nutritional readiness for pregnancy.

Goal #3—To help adolescents evaluate impressions about nutrition and physical appearance created by the media.

- Examine magazine pictures of models as well as television advertisements to come up with a description of the "ideal" male and female shape. Brainstorm ways in which this "ideal" may lead to poor health habits (e.g., skipping meals, excessive jogging or other exercise). Follow by writing a short article for the school or town newspaper on the topic "Societal Pressure Toward Thinness or a Muscular Build."

- Look through magazines and newspapers to collect advertisements for various weight reduction programs as well as those for body or muscle building. These might include appetite suppressants, "cellulite" eliminators, exercise devices, diet clinics, or nutrient supplements. Watch television to identify others. Then, hold a public hearing for each of the advertisements. For example, the class might pretend each of the ads had to be approved by a community group before it could be used. Advertisers would have to defend the claims made in the ads and secure a majority vote of the audience after questioning for continued use. Follow by suggesting guidelines which can be used to evaluate nutritional and appearance claims made in advertisements.

Goal #4—To help students select nutritious foods when eating away from home.

- Visit or write to a variety of fast-food establishments and ask for nutrition information about popular products (e.g., Kentucky-Fried chicken dinner, a Big Mac, a taco, french fries, a milkshake) or consult published data.[2,5,6] Compare calories and nutrients supplied by each. If possible, compare with other kinds of meals that might be prepared at home and/or eaten instead. Then, develop guidelines for selecting foods when eating in fast-food restaurants.

- Make a list of foods found in vending machines at school and/or in popular places away from home. Collect nutrient and calorie information about the foods.[2,5,6] Compare and contrast. Follow by developing a brochure giving suggestions for ways to maximize vending machine food choices as well

as ideas for snacks which might serve as alternatives to those found in vending machines.

- Ask school food service personnel to visit the class to discuss procedures involved in planning school lunches (e.g., federal guidelines, student preferences) as well as issues and problems in operating the school food service program (e.g., food wastage, fortifying typical fast foods). If desired, follow by arranging an experiment to analyze food wastage (e.g., watching for foods discarded after lunch).

Goal #5—To help adolescents recognize nutrients which are often in short supply in their diets, and the foods which contain these nutrients.

- Working in four groups and using a table of the nutrient values of common foods,[2] look through magazines and cut out pictures of foods which contain iron, calcium, vitamin A, and vitamin C. Paste pictures on posters illustrating the four nutrients and their food sources. Display posters and identify foods which appear in more than one place. Follow by comparing foods in each of the groups as to their value in supplying the nutrients (e.g., are they good sources or poor sources?).
- Work in groups to develop short public service announcements or skits which provide information about nutrients teens need and how they can be incorporated in the diet. Videotape the skits for future reference and/or arrange to broadcast the announcements over the school intercom.

Selected Resources

A Boy and His Physique and *A Girl and Her Figure* (1976). Booklets from National Dairy Council, 6300 N. River Road, Rosemont, IL 60018.

A Design for Health (1979). Two books with comics and activities for teenagers from Project Outside/Inside, Somerville Public School, 81 Highland Ave., Somerville, MA 02143.

Appetite Annie (1979). Pamphlet on teenage pregnancy free from Ralston Purina Co., St. Louis, MO 63188.

Dieting: The Danger Point (1979). Film on anorexia nervosa from McGraw-Hill Films, 1221 Avenue of the Americas, New York, NY 10020.

Foods, Fads and Fallacies (1976). Four filmstrips from Walt Disney Educational Media Co., 500 S. Buena Vista St., Burbank, CA 91521.

Food and Health: The Carbohydrate Connection (1979). Slides with script and handouts titled "The Knack of Snacking" show how to include more carbohydrates in meals and snacks. Order from Distribution Center, 7 Research Park, Cornell University, Ithaca, NY 14850.

Food for Life (1978). A film on malnutrition in American teenagers and worldwide with discussion of individual food choices. Available from Perennial Education, 477 Roger Williams, P.O. Box 855 Ravina, Highland Park, IL 60035.

Food ... Your Choice, Level 4 Home Economics (1980). A teaching kit for grades 7-10 that explores food and nutrition from a consumer frame of reference. Uses an experiential approach designed to help students apply new nutrition knowledge to everyday food selection. Available from National Dairy Council, 6300 N. River Road, Rosemont, IL 60018.

Gilbert, S.D. *You Are What You Eat* (1977). Book from Macmillan Publishing Co., 866 3rd Ave., New York, NY 10022.

Ikeda, S. *For Teenagers Only: Change Your Habits to Change Your Shape* (1978). Book on weight loss from Bull Publishing Co., P.O. Box 208, Palo Alto, CA 94302.

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Label Literacy: How to Read Food Packaging (1979). Two filmstrips with cassettes on using the information on food labels. Available from Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570.

LaSota, Marcia. *The Fast Food Calorie Guide* (1980). A brief history of the fast food restaurants and a summary of nutritional analyses of foods from the major fast food chains in the U.S. Available from Gabriel Books, P.O. Box 224, Mankato, MN 56001.

Mapes, M. and G. Harrison. *Trash Tells a Tale* (1977). Slides and audio cassette on wasted food. Available from Distribution Center, 7 Research Park, Cornell University, Ithaca, NY 14850.

Nutrition and You (1979). Five filmstrips with audio cassettes with good introductory information on selected topics relevant to teenage concerns. Available from Walt Disney Educational Media Co., 500 S. Buena Vista St., Burbank, CA 91521.

Shaping Up (1979). Two filmstrips with cassettes on weight loss, dieting, and exercise from The Polished Apple, 3742 Seahorn Drive, Malibu, CA 90265.

The Body Revolution: Revolutionize Your Life Through Nutrition, Behavior Change and Fitness. Checklists on eating habits, diets, exchange diets, meal planning, physical fitness, reasons and solutions to overeating. Available from Utah State Board for Vocational Education, Utah State Office of Education, 1980.

Watch Your Weight (1979). Filmstrip/cassette with teacher materials from Butterick Publishing Co., 708 3rd Avenue, New York, NY 10017.

Weiss, E. and N. Pettit. *Eclipse of the Blue Moon Foods* (1979). Teachers guide and student workbook for upper elementary units on foods and their relation to health. Available from The Cooperative Food Education Program, 2606 Westwood Dr., Nashville, TN 37204.

Footnotes

[1]U.S. Department of Agriculture, *Nutritive Values of Foods*, Home and Garden Bulletin No. 72. U.S. Government Printing Office, Washington, DC 20402, 1971.

[2]Pennington, I. and H.N. Church. *Bowes and Church's Food Values of Portions Commonly Used*, 13th edition. J.B. Lippincott Co., Philadelphia, PA, 1980.

[3]U.S. Department of Agriculture and U.S. Department of Health, Education, and Welfare. *Nutrition and Your Health: Dietary Guidelines for Americans.* U.S. Government Printing Office, Washington, DC 20402, 1980.

[4]Phillips, Margaret. *Food for the Teenager During Pregnancy.* DHEW Publication No. (HSA) 76-56 11, U.S. Government Printing Office, Washington, DC 20402, 1976.

[5]Rezabek, K. *Nutritive Value of Convenience Foods*, Second Edition. West Suburban Dietetic Association, Box 1103, Hines, IL 60141, 1979.

[6]Beno, M.C. *Mini Guide to Fast Meals.* Pamphlet from Memorial Hospital Medical Center, 2801 Atlantic Ave., Long Beach, CA 90801, 1979.

IV. Adults

NEEDS

In normal healthy adults, nutrients and energy are needed for maintenance (repair and replacement) of body tissues and for activity, but not for growth. Therefore, on a pound-for-pound basis, adults generally have lower nutrient requirements than children. The most noteworthy exceptions are pregnant and lactating women and persons who have suffered extreme physical trauma such as severe burns.

Most adults find they need fewer calories as they advance in age for two reasons: 1) the basal metabolic rate declines by about two percent per decade after growth stops,[1] and 2) there is usually less physical activity with advancing age. This makes "middle-age spread" a common concern of adults, especially those who regularly consume a fair amount of calories in the form of alcohol.

Lifestyle patterns including diet and exercise are usually firmly established by the time a person reaches adulthood. However, many adults find themselves becoming increasingly concerned with health and longevity—a factor which often motivates them to follow food fads or to start buying many kinds of "health foods" and vitamin supplements.

Parenthood brings special responsibilities to a majority of adults at some time. Not only are they faced with providing proper food for growing youngsters but also with helping their children develop sound dietary habits and attitudes. This is when it is especially important for adults to understand the nutritional needs of children.

Many factors make it difficult for the elderly to consume a nutritious diet. Loss of natural teeth, decreased saliva, and declining taste acuity make fresh fruits and vegetables less enjoyable at a time when the bulk they add to the diet is particularly useful in lessening constipation. Elderly persons often live alone, so snacks and irregular meal patterns become common. Disease, disabilities, loneliness, low-income, and meager cooking facilities sometimes make it increasingly difficult for them to prepare good meals.

At any age, low income is a barrier to obtaining an adequate diet. Planning and preparing a variety of nutritious meals can be a frustrating task on a limited budget. Low income and low educational levels have been associated with inadequate intakes of vitamins A and C.[2] There are, however, many outreach programs such as Food Stamps which provide nutrition education as well as financial assistance.

The suggested strategies for providing nutrition education for adults which follow are divided into four categories related to needs: Needs of the adult population in general, the elderly, persons with low incomes, and parents. Such strategies might be implemented on a small-scale basis directly with the populations (e.g., as a seminar presented by the home economics teacher to a group of senior citizens at a local community center) or other persons might be trained on a cadre basis to implement the strategies. The secondary home economics teacher might, for example, help high school students prepare to provide such education and they might then plan and implement a program as a class, or as an FHA or HERO chapter activity. Depending upon services available in local communities, students might discover opportunities to team up with existing programs by offering assistance to those such as the Special Supplemental Foods Women, Infant, Children (WIC) Program for low-income mothers and children or Cooperative Extension's Expanded Food and Nutrition Education Program (EFNEP) for low income families. An added benefit of this latter approach is that it has much potential for producing positive concomitant (incidental) learnings as persons of different ages and backgrounds work together.

LEARNING EXPERIENCES

The General Adult Population

Goal #1—To enable adults to more accurately differentiate between nutrition information and nutrition misinformation.

- Watch advertisements on television and/or look in magazines (especially those which are used to promote health foods and vitamins) to identify different messages or impressions given about various foods, nutrients, and diets. Then, evaluate the ads in relation to theories which are often used to promote nutrition misinformation[3] (e.g., some special food will keep you healthy, certain illnesses are caused or cured by specific foods, there are "natural" and "unnatural" foods, our food supply is "contaminated" with chemicals and lacking in nutrients because of depleted soils). Identify specific reasonings which may be faulty (e.g., though a few diseases can be cured by certain vitamins (scurvy by vitamin C), these are rare in the United States; there are "natural" substances in foods which can also be harmful such as some molds; foods labeled as "natural" or "organic" are often much more expensive, and certain chemical additives give us variety and convenience in our food supply). Summarize by suggesting guidelines to use in evaluating information about new ways to eat (e.g., What authority/background does the promoter have?, Is there money to be made on the idea?, Does the diet restrict eating to a few foods only?, Does the promoter use emotion-laden or meaningless terms like "wholesome," "synthetic," or "miracle-cure?").

Goal #2—To enable adults to identify and eliminate the sources of excess calories in their diets.

- After examining nutrient and energy values of various foods, brainstorm common ways in which excess calories often enter the diet (e.g., the ice cream with the pie, both butter and sour cream on the baked potato, the doughnut at morning coffee time, two martinis at lunch, an extra tablespoon of salad dressing. Then, for this week, identify at least one source of extra calories you could eliminate. Try to follow the next week by eliminating at least one more source.

The Elderly

Goal #1—To help senior citizens become familiar with food and nutrition services available to them in their community.

- In a small group setting, identify food for seniors programs with which you are familiar (e.g., participation in public school lunch programs, Meals on Wheels, Golden Diner's Club, Nutrition Program for the Elderly, Independent Living shopping busses). Share personal experiences with the programs. Then, arrange to "try out" one or more with which you may not be familiar.
- Conduct a telephone survey of local restaurants or food stores to identify those who offer special portions and/or prices for seniors. Compile information in booklet form for use by other seniors in your area.

Goal #2—To encourage the regular eating of nutritionally balanced meals by seniors.

- To help combat the problem of shopping and preparing meals for one or two, sponsor a suggestion collection campaign through your local senior center, church, radio station, or newspaper. Suggestions might include favorite recipes in small portions, easy and/or low-cost recipes, tips for making meals easier and/or more attractive (e.g., freezing portions of favorite recipes, using elegant table settings, buying foods in small quantities and/or in individually wrapped larger quantities). Prizes and/or public recognition might be given for "Best of each Category." A publication could be made of suggestions with receipts from sales used to carry out another nutrition-related project.
- Arrange to have a local meat-cutter visit a common meeting place such as a senior center to demonstrate ways in which larger cuts of meat (e.g., a chuck roast or pork shoulder) could be cut into smaller pieces suitable for several future meals (e.g., part of the chuck for small pot roast or sauerbraten, part for stew meat, and part for swiss steak; part of the pork shoulder for roast, part for steak, and part for chop suey). Follow by exchanging favorite recipes for dishes suggested.

- Following investigation of the nutrient needs of seniors, organize a "share-a-meal" program in your apartment complex, senior center, or church. Individuals might sign up to share one or two nutritionally balanced meals a week with other interested persons by taking turns planning and preparing meals or by planning and preparing them jointly. The most successful of the experiences and reasons why might be shared with others at periodic "idea-exchange" sessions.

Persons With Limited Incomes

Goal #1—To enable persons to select, plan, and prepare lower-cost meals which have high nutrient value.

- Working in groups and using lists of foods which are good sources of nutrients (e.g., carbohydrates, proteins, and certain vitamins and minerals), calculate cost per serving of several representative foods in each category. (Newspaper ads or a grocery store price list could be used for this.) A sample comparison might be the cost of two ounces of protein in the form of bologna, hot dogs, chicken, hamburger, sirloin steak, crab, omelet, peanut butter, and/or cheese. Interested persons might further calculate the cost of various forms of certain of the foods (e.g., fresh, frozen, canned, ready-to-eat or heat). Share findings. Follow by developing a list of guidelines to use in planning nutritious low-cost meals.

- After exploring alternative sources of similar nutrients and the costs associated with them, look through several cookbooks and/or magazines to identify some interesting recipes. Favorite family recipes might also be shared. Then, working as a group, suggest ways the cost of each recipe might be reduced without reducing nutritional value or radically changing appeal (e.g., substitution of cream of shrimp soup with cream of mushroom, stewed chicken for chicken breasts, mushroom stems and pieces for sliced, yogurt for sour cream). Summarize by developing some generalizations which can be used in reducing the cost of other recipes in the future.

Goal #2—To help persons recognize shopping strategies which may be used to reduce food expenditures without reducing nutritional quality of meals.

- In a group setting, individually fill out questionnaires about common shopping practices. Questions might relate to: 1) type of store used (large, small), 2) frequency of shopping trips, 3) use of coupons, 4) use of lists, 5) whether children were taken along, 6) degree of hunger, 7) purchase of brand name products, 8) purchase of economy-sized packages, 9) purchase of advertised specials, 10) purchase of convenience foods, 11) purchase of prepared snack foods. Then, as a group, brainstorm ways each practice might affect the food budget and nutritional quality of meals positively or negatively (e.g., children often pressure a parent to buy certain foods, store brands are often less expensive but equally nutritious). Summarize by developing generalizations about ways to reduce unnecessary food expenditures when shopping without reducing nutritional quality of foods purchased.[4]

- Spend some time investigating the kinds of information included on food labels perhaps with a prepared learning kit or pamphlets.[5] [6] Then, working in groups, and using grocery bags filled with common food items that have nutrition labels, compare cost with nutritional value. Summarize by developing one or more generalizations about ways information on food labels can be used to make the "nutritional most" of the food dollar.

Goal #3—To help persons get the most out of that portion of the food budget spent on meals eaten away from home.

- Conduct a survey of restaurants offering nutritious meal "specials" (e.g., lower cost earlier in the evening, daily specials or weekly specials, lower costs for children's portions). Compare prices with other meals of comparable nutrient values offered on the menu at the same and different times. Develop a brochure listing good restaurant meal values and distribute to interested persons.

Parents

Goal #1—To help parents recognize the powerful effect of their behavior in shaping children's eating habits.

- Working alone, make a list of food likes and dislikes. Then, reflect upon your parents' food likes and dislikes. Identify food preferences which may have been "learned" from your parents. Follow by identifying positive as well as negative

personal eating patterns (e.g., related to types, frequency, and amounts of snacking, eating or not eating breakfast, planning regular sit-down meals). Speculate about positive and negative eating habits which may be being passed on to your children.

- Think of examples of times when food is used as a reward, pacifier, or punishment for children (e.g., giving a cracker to a crying child, giving a cookie for good behavior, making a child sit at the table until he/she has cleaned their plate, sending a child to bed without dinner.) Identify possible positive and negative long-term results of such behavior. Then, for each situation listed, suggest alternative ways of dealing with it. If possible, implement one or more of these ideas in a real-life situation. Follow by preparing a summary of the results.

Goal #2—To help parents more effectively encourage their children to develop good eating habits.

- After studying the nutritional needs of children, look through cookbooks or magazines to identify ideas for nutritious snacks, including some children might help perpare (e.g., frozen bananas, whole grain breads, carrot crinkles, radish roses). While looking through the resources identify some recipes which could be made more nutritious by modifying them (e.g., decreasing sugar or salt, adding peanut butter, nuts, raisins, or powdered milk). Follow by developing an idea book including recipes and guidelines for modifying other recipes to distribute to parents or other interested persons.

- Invite a dentist or other health professional to discuss the relationship between sugar consumption and dental caries in children. Then, develop two lists of sweet foods: 1) those that are sticky and stay on teeth longer (e.g., caramels, taffy) and 2) those that are more liquid in nature (e.g., syrup from canned peaches, ice cream). Then, considering nutritional value of the foods as well as the texture, develop two lists of treats for children that would be better if a) never offered and b) sometimes offered.

- Using your own experiences and/or those of which you have heard, identify foods children often do not like to eat (e.g., liver, vegetables, oatmeal). Then, brainstorm or use recipe books or magazines to suggest ways of making the foods more attractive to children (e.g., steam and/or use sauces on vegetables, make raisin or fruit faces on oatmeal, fry liver with bacon, serve food in small portions). Follow by identifying other factors which may positively affect children's eating behavior at mealtime (e.g., relaxed peaceful mealtimes, noninsistence on cleaning plates, limiting snacks close to meals).

Goal #3—To develop understanding of the relationship between food consumption and hyperactivity in children.

- View *Nutrition and Hyperactivity*, a videotape about factors which may contribute to hyperactivity in children (see resources at end of this section). Summarize variables which may account for disparities in the outcomes of studies which have sought to explain the relationship between intakes of sugar and additives and hyperactivity. If desired, arrange for a health professional to discuss the "holistic approach" often used to treat hyperactivity in children.

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Comparison Cards (1978). Set of colorful bar graphs showing nutrient profiles of popular foods available from National Dairy Council, 6300 North River Road, Rosemont, IL 60018.

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General Mills American Family Report (1979). A survey of health practices of American families from General Mills, Inc., Dept. 15, P.O. Box 1112, Minneapolis, MN 55440.

Guidelines to Good Health (1978). Pamphlet with overview of current nutrition topics from Kraft Educational Department, 500 Pestigo Court, Chicago, IL 60690.

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The Way We Eat (1980). Booklet on current topics of concern from Rhode Island Department of Health, 75 Davis St., Providence, RI 02908.

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Wurtman, J.J. *Eating Your Way Through Life* (1979). A guide to making wise food choices for all ages from Raven Press, 1140 Avenue of the Americas, New York, NY 10036.

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[1]Food and Nutrition Board. *Recommended Dietary Allowances, Ninth Revised Edition.* National Academy of Science, National Research Council, Washington, DC, 1980.

[2]U.S. Department of Health, Education and Welfare, *Ten-State Nutrition Survey,* 1968-70. U.S. Government Printing Office, Washington, DC 20402, 1972.

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[4]U.S. Department of Agriculture. *Family Food Budgeting* and *Your Money's Worth in Food.* Booklets available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

[5]National Dairy Council. *Label It Nutrition.* A program for studying nutrition labeling and the information on food labels. National Dairy Council, 6300 North River Road, Rosemont, IL 60018, 1975.

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V. Athletes

NEEDS

Nowhere is the mixture of science/emotion/superstition more prevalent than in the world of athletics. Both professional athletes and weekend joggers share a concern about maximizing physical performance, and they get lots of advice from coaches, fellow athletes, friends, doctors, and the popular press. It is no wonder that there are so many beliefs linking foods to athletic prowess. Most of them are not founded in scientific fact, however, and some can be actually dangerous.

A variety of forums provide opportunities to initiate nutrition education for athletes. In the secondary schools, for example, learning experiences might be integrated into regular home economics classes or they might be presented in an interdisciplinary course merging home economics and physical education. Many opportunities also exist for conducting mini-sessions or workshops with sports teams and coaches as well as with secondary school youth groups such as Future Homemakers of America. In many communities there are also groups organized around interest in specific sports (e.g., canoeing, skiing, mountain climbing) that may wish to learn more about nutrition as it relates to their activities. Church groups and 4-H Clubs also offer potential audiences who may be interested. Regardless of the forum chosen for providing nutrition education for athletes, there are several issues which are especially important to address. Included are the following:

Fluid Replacement. Vigorous activity can cause large amounts of water to be lost as sweat, and, performance declines after two percent of body weight is lost. Therefore, water should be consumed in extra amounts to compensate for such losses. Salt tablets are not advised because Americans typically consume more than enough sodium in their regular meals. If sweating if profuse, the athlete can add a little extra salt to his or her food and/or drink water which has one tablespoon of salt per gallon. In any case, salt tablets should be avoided because they hasten dehydration.[1] Eating sugar or honey during or directly before an event can be dangerous for the same reason.

Calorie Needs. Energy needs increase in proportion to the time and duration of vigorous activity. Thus, a long distance runner will use more energy per hour than a football player who is in a "hit/rest" situation. Appetite increases automatically when energy needs are high, so there is no need to force normal weight athletes to consume extra calories.

Protein Needs. Protein consumption does not need to be supplemented for athletes. Americans tend to consume about twice as much protein as they need anyway, and eating extra protein does not build muscles.

Iron Needs. Iron deficiency causes anemia, a decrease in the oxygen carrying capacity of the blood. Therefore, athletes (especially menstruating women) should have a routine hemoglobin or hematocrit test and consider taking iron supplements if anemia is detected.

Mealtimes/Pre-competition Eating. When there is food in the stomach, part of the blood flow that could be made available to the muscles is diverted to the gastrointestinal tract. Thus, a pre-game meal should be eaten at least two or three hours before an event to allow for digestion. Foods which are high in fat (e.g., steak) are digested slowly, so they should be avoided, especially if eaten less than two hours before "the big game."

"Glycogen loading" or "glycogen supercompensation" is a dietary regimen wherein the body's glycogen stores are depleted and then built up to a high level. These practices are only pertinent in sports where long-term endurance is critical, and then negative side effects such as fluid accumulation, electrolyte imbalances, and weight gain make them

difficult to manage without expert medical advice.

Chemical Stimulants. Using "pep pills" or amphetamines to avoid the feeling of fatigue and taking hormones such as anabolic steroids to increase muscle size/strength are not recommended. These practices can be particularly dangerous for children and young adults who may still be growing. Side effects such as addiction, sterility, and possible liver damage make such drugs too risky for the average athlete to consider, especially since the "benefits" are mostly unproven.[2]

It is especially important that persons who are interested in athletics, including those only moderately involved, be able to recognize common fallacies surrounding the relation between eating patterns and physical performance. Some suggested goals and activities designed to help individuals develop these skills follow.

LEARNING EXPERIENCES

Goal #1—To enable the athlete to differentiate between facts and fallacies surrounding the effect of various dietary patterns upon athletic performance.

Focus: General/Introductory

- In a large group setting, brainstorm ideas you have heard about how certain foods or eating patterns affect athletic performance and/or body build (e.g., "I need a protein supplement to replace protein torn down in muscles during exercise," "A candy bar eaten before an event will make me perform better," "Eating a lot of steak will help build muscles faster," "Special sports drinks like Gatorade are better to drink than plain water or diluted fruit juice during athletic competition," "Drinking milk before an athletic event causes cottonmouth," "Drinking wine while skiing keeps you from getting cold"). Then identify specific categories of beliefs to investigate further.

Focus: High Protein Diets

- After learning about the nature of protein and its place in the diet, look up the Recommended Dietary Allowances for protein for persons of your age group. Then identify the protein content of various kinds of common foods and compare. Calculate the amount of protein you normally eat in a day and compare with body needs. Follow by carrying out independent investigations to identify facts and fallacies surrounding the necessity of eating high protein diets and/or using protein supplements to increase level of performance and/or build muscle (e.g., after comparing cost and label information on protein supplements one might conclude that they are not a more effective source of protein than that found in animal products or combinations of vegetable products yet are more expensive; after analyzing the diets of several athletes, it might be discovered that most eat much more protein than needed normally; current nutrition or sports medicine journals might reveal that protein in muscles is not metabolized (torn down) during exercise and that excess protein intake can cause body dehydration and provide extra work for the kidneys in excreting excess nitrogen).

Focus: "Cottonmouth"

- Arrange an experiment in cooperation with a physical education class or sports team as follows: Provide milk for part of the group to drink before physical exercise and something else for the other. Class or team members should not be told the truth about why they are being given milk; another reason could be given such as testing preference for milk versus fruit juice. After the exercise or event, survey persons participating as to whether or not they experienced "cottonmouth."

Focus: Replacement of Body Fluids Including Minerals

- Ask a health professional (e.g., nurse, physician, or health teacher) to discuss the process of body dehydration, the possible effects upon health and athletic performance, as well as common methods used to replace body fluids and minerals (e.g., performance declines when an athlete loses two percent of body weight as a result of sweating; dehydration may lead to fainting, especially during hot weather; taking salt tablets after heavy sweating can cause nausea and further dehydration; escessive use of foods or drinks high in sugar may cause cramping as the sugar draws fluids to the stomach). Then, use what you have learned to prepare a slide show, videotape, or newspaper article giving suggestions for athletes to follow about avoiding and dealing with dehydration during athletic competition.
- Collect labels from one or more of the sports drinks available on the market. Compare the ingredients in each (e.g., percent water, sugar, salt, potassium) as well as cost per ounce. Compare with the cost of homemade drinks (in which sugar concentration can be diluted to at or below the 2.5 grams sugar per 100 milliliters water level recom-

mended to avoid cramping which might occur with ingestion of too much sugar during strenuous exercise).[3] Then identify alternative ways of replacing the small amounts of sodium and potassium usually lost during strenuous exercise (e.g., common salting of food, eating bananas and citrus fruits which are rich in potassium).

- Arrange with a sports team to weigh individuals before, during, and after strenuous exercise. Collect information about how thirsty individuals feel at these times. Summarize by developing suggestions for how much water the persons need to consume to replace fluid losses. Speculate about whether or not thirst is always a good indicator of fluid needs.

Focus: Vitamin and Mineral Supplements

- Using hypothetical or actual dietary intake records, calculate the amounts of the major vitamins and minerals consumed. Compare with Recommended Dietary Allowances. Then, collect labels from several popular multi-vitamin and mineral supplements. Summarize by developing generalizations about the cost versus the benefit of taking such supplements. (Note: It may be of benefit to differentiate between fat soluble and water soluble vitamins and to relate to the long term effects upon health of taking massive dosages of each in light of their lack of benefit in improving physical performance.)
- As a group, think about the term "tired blood." Share ideas about what it refers to and where impressions came from. Then, using available resources, work in groups to learn about the role of iron in the body, iron deficiency anemia, sources of iron in foods, and Recommended Dietary Allowances for iron for males and females. If possible, invite a physician to discuss the purposes of a hematocrit test and the procedure involved. Summarize by discussing the following issues: a) ways in which the relationship between iron and energy is sometimes exaggerated, b) reasons why women athletes may need iron supplements, c) reasons why iron supplements may produce medical complications in males, d) ways of incorporating iron-rich foods in the diet, and e) factors other than iron which may cause anemia.

Focus: Use of Alcohol

- Conduct an "Impressions About Alcohol" session by responding to an opinionnaire about the effects of alcohol on health and performance during athletic activity. Responses could be simply agree-disagree or based on a Likert-type degree of agreement scale such as strongly agree to strongly disagree. Statements might include the following: Drinking brandy or hot spiced wine periodically during skiing can prevent the chills, Ingestion of alcohol during warm weather may prevent overheating, Alcohol tends to dilate major blood vessels in the body, Alcohol often acts to stimulate the central nervous system, Small amounts of alcohol do not significantly affect body coordination. Tabulate responses to statements and discuss areas of agreement and disagreement, including rationale. Follow by discussing ways in which perceptions sometimes created by media and popular practice may not always be true. End by suggesting guidelines to follow for using alcohol during participation in sports and alternatives to alcohol.

Focus: Eating for Specific Events

- Using available resources, explore the processes of digestion including mechanical and chemical. Differentiate between digestion, absorption, and metabolism. Compare the relative length of time proteins, carbohydrates, and fats remain in the stomach during digestion and relate to the diversion of blood flow from muscles used in various athletic activities. Using this knowledge, generate several statements about what and when a person should eat prior to beginning strenuous physical exercise (e.g., eat two to three hours before beginning exercise, avoid foods high in fat).
- Write a short paragraph about your feelings regarding "quick energy" foods (e.g., what they are, why they are thought to give bursts of energy, and where you heard about them). Then, read pertinent articles and ask a nutritionist to discuss the various forms and sources of carbohydrate and its potential effects upon athletic performance (positive, neutral, and negative) when consumed well before, immediately before, and during athletic competition.[4] Summarize by rewriting your paragraph using new knowledge gained. Develop a title that illustrates the essence of what you have said (e.g., "The Pre-game Candy Bar is Dead") and share with other members of the group.
- Conduct a survey of local or school athletes to determine the number who practice glycogen loading. Identify specific procedures followed and the sports for which it is used. Then consult a nutrition and physical performance text or scien-

tific article[5] to learn more about the practice, including rationale, procedures, benefits, and potential dangers. Summarize by developing several generalizations about when it is and is not useful and about how it should be done in appropriate situations.

Goal #2—To enable persons concerned about weight loss or gain as related to athletic performance to differentiate between prudent and potentially dangerous dietary practices associated with it.

Focus: General Weight Control

- For persons interested in determinig whether they need to increase or decrease calorie intake to maintain weight in relation to their athletic involvement, keep track of the number of minutes spent in various activities each day for one "usual" week. At the same time, keep track of food intake. Then, using tables specifying calorie content of foods[6] and calorie expenditures of various physical activities,[7] compare intake and expenditure allowing for basal metabolism. (For adults, multiply body weight in kilograms by 24 to roughly determine basal needs in Kcal/day). Use what is learned to modify calorie intake as needed. Summarize by comparing calorie needs in relation to type of athletic activity such as long distance running versus activities requiring spurts of energy such as baseball.

Focus: Weight Loss

- Invite a panel of persons who serve as officials for school wrestling matches to discuss weight classes used, number of persons allowed to compete in each, weigh-in scheduling and what it means to "make weight." Then, review one or more position stands on weight loss in wrestlers.[8,9,10] Compare with local practices.
- Ask a number of local wrestlers to keep track of their weight fluctuations over a period of time (e.g., pre-season weight, between, and right before matches). Calculate individual and group percentage losses and gains over time. If possible, ask a physician to discuss the effects of fluid deprivation on wrestling performance (e.g., usually leads to reduction of muscular strength, higher heart rates, impairment of body heat regulating processes) as well as the effects of severe weight fluctuations. Using what you learned along with perhaps a position stand on weight loss in wrestlers, develop several guidelines which would be useful to wrestlers concerned about maintaining low weight (e.g., avoid use of diuretics and laxatives, avoid eating binges, follow a long-term diet which eliminates empty calorie foods).

Focus: Weight Gain/Body Building

- To explore impressions about the relation between strength and weight, finish the following incomplete sentences:
  To increase strength, one should . . .
  To build muscle, one should eat . . .
  Body building requires . . .
  Then explore, in a group discussion, the relation between degree of exercise and muscle mass as well as between muscle size and body weight and increased calorie intake and number and size of fat cells in the body. Follow by speculation about what can happen to athletes later in life as a result of the establishment of excessive eating habits earlier.

Goal #3—To enable individuals and families to plan and/or select meals and snacks which are appropriate in relation to their athletic activities.

- Survey a number of parents of teenage athletes to discover the problems they face in scheduling and planning meals (e.g., child not hungry after activities, after school and early evening practices make mealtime scheduling difficult). Then work in groups to develop suggestions for ways these problems might be minimized (e.g., ideas for nutritious meals which could be kept warm such as in a crockpot, ideas for light nutritious snacks which could be made at home or selected from vending machines).
- Hold a brainstorming session to identify kinds of athletic activities which may be a part of the focus of family or group outings (e.g., bicycling, running, cross-country or downhill skiing, canoeing, climbing). Follow by working individually or in groups to develop ideas for nutritious snacks or meals that could easily be taken along.

Selected Resources—Athletes

Astrand, P.O. and K. Rodahl. *Textbook of Work Physiology* (1977). A very technical reference book from McGraw-Hill Book Co. Princeton Road, Hightstown, NJ 08520.

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Briggs, G.M. and D.H. Calloway. *Bogert's Nutrition and Physical Fitness* (1979). A textbook on general nutrition with emphasis on fitness from W.P. Saunders Co., West Washington Square, Philadelphia, PA 19105.

Food for Fitness (1979). A filmstrip/cassette with teacher materials for high school audiences. Available from Butterick Publishing, 708 Third Avenue, New York, NY 10017.

Hanley, D.F. "Basic Diet Guidance for Athletes," *Nutrition Today*, Nov/Dec 1979, pp. 22-23.

Nutrition and Athletic Performance (1980). A 40-minute videotape for teachers and coaches from Instructional Media Distribution Center, 225 N. Mills Street, Madison, WI 53706.

Nutrition and Exercise (1980). Two filmstrips with cassette tapes giving timely and entertaining advice on nutrition for athletes. Available from Sunburst Communications, Inc., Pleasantville, NY 10570.

Smith, N.J. *Food for Sport* (1976). Excellent reference book for athletes and coaches from Bull Publishing Co., P.O. Box 208, Palo Alto, CA 94302.

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Footnotes

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[2]Astrand, P.O. and K. Rodahl. *Textbook of Work Physiology*. (See bibliography this section).

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[5]Jette, M. et al., "The Nutritional and Metabolic Effects of a Carbohydrate-rich Diet in a Glycogen Supercompensation Training Regiment," *American Journal of Clinical Nutrition*, Vol. 31, 1978, pp. 2140-2148.

[6]U.S. Department of Agriculture. *Nutritive Value of Foods*. Home and Garden Bulletin No. 72, U.S. Government Printing Office, Washington, DC, 1971.

[7]"Calories Burned in Various Physical Activities" in *Fitness and Work Capacity*, Forest Service, USDA, FS-315, U.S. Government Printing Office, Washington, DC 20402.

[8]"American College of Sports Medicine Position Stand on Weight Loss in Wrestlers," *Sports Medicine Bulletin*, Vol. II, No. 3, July 1976, pp. 1-2.

[9]"Crash Diets for Athletes Termed Dangerous, Unfair," *A.M.A. News*, Vol. 2, 1959, p. 2.

[10]A.M.A. Committee on the Medical Aspects of Sports, "Wrestling and Weight Control," *Journal of The American Medical Association*, Vol. 21, 1967, p. 541.

VI. Persons with Special Nutritional and Educational Needs

Aside from the normal needs experienced as a typical person proceeds through the life cycle, there are situations which demand individualized attention from nutrition educators. In these cases, the educator must make sure the information he or she presents is appropriate in both content and method of presentation.

NEEDS

Method of Presentation

Many handicaps, diseases, and disabilities produce special educational needs. For example, a person with a hearing impairment may have the same nutrient needs as his/her hearing peers, but the format of nutrition education for such an individual must emphasize visual and tactile media. Similarly, persons with learning disabilities may need simplified language and frequent repetitions of basic nutrition information with short "hands on" demonstrations and several built-in reinforcements of previous learnings.

Content

There are many persons with special nutritional needs who may be taught by conventional methods. For any of these conditions, the nutrition educator must take particular care not to contradict or interfere with the primary source of treatment (i.e., the physician). Examples are obese adults who may need material on calorie restriction and behavior modification, the diabetic who uses exchange lists for food selection to comply with calorie and macronutrient limits, a person with familial hyperlipidemia who must limit fat and possibly cholesterol intake, the hypertensive person who is following a sodium restricted diet, a person with a gastrointestinal problem such as diverticulosis who has been advised to increase the fiber in his/her diet, and the person with a food allergy who must avoid all foods that contain a particular substance (e.g., egg whites).

Vegetarians and persons who follow certain dietary restrictions for legitimate personal or religious reasons should have their wishes respected by nutrition educators. At the same time, however, educators must use cautious judgment to avoid encouraging food faddists who may try to influence others to follow undesirable eating patterns which are unnecessarily restrictive.

Special Content and Educational Method

There are instances which require individualization of both content of information and method of presentation; a diabetic individual with a visual handicap would be an example. Severe metabolic disorders, such as phenylketonuria which causes both mental and physical abnormalities, are usually best handled by teams of professionals who follow coordinated treatment programs including dietary manipulation and nutrition education.

The suggested goals and activities which follow are divided into two categories: those appropriate primarily for persons with special educational needs and those appropriate primarily for persons with special nutrition information needs. Educators working with individuals or groups which have special needs in both areas may find it useful to combine experiences from the two categories as needed.

Goal #1—To assist overweight individuals in modifying undesirable eating habits.

Focus: Weight Control

- Working alone, keep a record of what you eat for at least three days. Next to each food eaten, indicate a) what you were doing and b) how you felt right before you ate the food (e.g., watching television, having mid-morning coffee, elated, bored, lonely, anxious). As a group, identify common events and feelings which trigger undesirable eating habits. Then, work in small groups to suggest ways to circumvent undesirable eating behaviors based on categories of possible reasons for the behavior. For example:

Possible Reason	Alternate Behavior
Tension or Anxiety	Jogging, cold shower, call a friend
Elation or Reward	Buy someting new (a book, a suit, cosmetics), plan a trip, go dancing, skating, or skiing.
Boredom	Join a club, do volunteer work, develop a new hobby
At a party	Drink club soda with lemon, converse away from appetizer table

- As a group, think about the word "temptation" as it relates to eating. On a blackboard or easel, record words and phrases associated with it. Analyze the list to identify specific eating temptation pitfalls. Follow by developing strategies which can be used to avoid falling into the pits (e.g., leftover foods—cook only enough, store out of sight, mid-afternoon coffee—bring celery or carrot sticks).

Goal #2—To enable overweight individuals to select and prepare foods in a manner which leads to a reduction of empty calories in the diet.

- After exploring the calorie and nutrient content of foods, examine a food intake case study and identify foods which are high in calories in relation to their nutrient content. Then, using a calories countdown chart[1] (which lists foods similar in nutrients but higher and lower in calories), modify the food intake case study to reduce calories without significantly reducing nutrients. As a group, brainstorm other ideas for eliminating unnecessary or empty calories when selecting and preparing foods (e.g., broil or boil rather than fry, use skim milk rather than whole, select fruit canned in natural juice rather than heavy syrup, use lemon juice for salad dressing). Follow by modifying a personal food intake record using new information. If desired, arrange a low-calorie menu and recipe exchange in a format convenient for group members. Individuals might share ideas in a one-time discussion session, in a series of sessions, in a newsletter, or on a changing bulletin board in a central location. Along with the menus and recipes, individuals may well want to specify the nutrient contributions of the foods to the diet.

Goal #3—To enable overweight individuals to recognize fallacies in fad diet plans.

- As a group, brainstorm diet plans you have heard about (e.g., drinking man's diet, ice cream diet, low-carbohydrate diet, grapefruit diet, "candy" mineral and vitamin supplements, diet bars, liquid protein). If possible, locate actual diet plans. For each plan, calculate the number of calories included. Follow by discussing the relation between calorie intake, foods eaten, and weight loss or gain, monotony in eating as it affects nutritional status and one's ability to change long-term eating habits, and the value of testimonials in judging diets.

- Take an informal survey to determine numbers of persons who have read or heard about the protein-sparing fast or last chance diet for losing weight.[2] Then, collect a number of containers of liquid protein food. Compare and contrast nutrients and calories in different brands as well as cost. Then, read one or more articles discussing the dangers of protein-sparing diet plans.[3] Follow by summarizing advantages and disadvantages of this method of weight control (e.g., advantage of a specific eating plan and exact calorie control,

cost, health risks, and possibility of weight gain if plan is not followed).

Focus: Modifying Fat Consumption

Goal #4—To develop understanding of the reasons for current concerns about the high level of fat in the typical American diet.

- Use a "game of health and heart" to estimate personal risk of developing heart disease.[4] (Look at family history (H-eredity), level of exercise (E-xercise), age (A-ge), weight (L-lbs.), smoking habits (T-obacco), and fat consumption (H-abits of eating fat) = HEALTH). Then, ask a physician to summarize why these and other risks, such as stress, high blood pressure, and increased blood cholesterol, are often associated with heart disease. If desired, follow up by reading the findings of the U.S. Senate Select Committee on Nutrition and Human Needs[5] which led to the recommendation that fat consumption be reduced.[6] (Note: Though less detailed, the U.S. Department of Agriculture—U.S. Department of Health and Human Services 1980 *Dietary Guidelines for Americans*[7] and the 1979 Surgeon General's Report *Healthy People*[8] may also be of interest.)
- Hold a brainstorming session to identify group feelings about cholesterol (e.g., what it is, why it is thought to be dangerous, what foods contain it). Then, using a word chart and/or word scramble or crossword puzzle, differentiate between terms used to describe the fats which are found in food (e.g., lipid, triglyceride, phospholipid, sterol, saturated, polysaturated and unsaturated fats, cholesterol, fatty acid). To learn about the controversies surrounding the relation between dietary cholesterol intake, serum cholesterol levels, and atherosclerotic plaque, review available literature[8,9] and stage a group debate on the subject.

Goal #5—To enable individuals to reduce dietary fat, one of the risk factors associated with coronary heart disease.

- Using a personal dietary intake record and a Table of Food Composition[10,11,12] analyze personal fat consumption in relation to the U.S. Senate Dietary Goals[13] which include:
  1) Reducing overall fat consumption to 30 percent of total calorie intake
  2) Balancing fat consumption to include a 1:1:1 ratio of polyunsaturated, monounsaturated, and saturated fat items (10 percent of total calories each)
  3) Reducing cholesterol intake to approximately 300 milligrams per day

  (Assistance in making these calculations can be found in *Nutrition Concepts and Controversies.*[14] Follow by using what you learned about the fat content of various foods to suggest ways fat consumption could be brought more closely in line with the recommendations, if necessary. This might take place as sharing of recipes and/or food preparation techniques during one or more follow-up sessions.

Focus: Sugar Utilization Concerns

Goal #6—To enable diabetics and other interested persons to understand the disease and plan long-term eating strategies which will aid in its control.

- For relatives of persons who have diabetes and other interested persons, arrange to have a member of the local American Diabetes Association and/or a physician speak about the different kinds of diabetes (e.g., time of onset, theories of cause, symptoms, populations affected, and treatment or control including differences between a diabetic coma and an insulin reaction). Follow by viewing a slide/tape program (see Coale in resources section) about how the 1976 American Dietetic Association's food exchange lists can be used in planning meals for diabetes control. Additional sessions might focus on:
  A. Developing sample menus for meal plans at various calorie levels, considering individual and family food preferences.
  B. Sharing gourmet recipes for diabetics.[15]
  C. Comparing costs of various types and brands of dietetic foods on the market.
  D. Sharing techniques for preserving food using little or no sugar.

Focus: Sodium Restriction Concerns

Goal #7—To enable individuals to recognize the sodium content of their diets and reduce the level ingested, if needed.

- Review the U.S. Senate Dietary Goals,[16] the USDA-HEW *Dietary Guidelines for Americans,*[17] and *Toward Healthful Diets*[18] to identify recom-

mendations regarding sodium consumption and the rationales for them (e.g., to reduce chances and dangers of high blood pressure, hypertension). Then, using tables printed in the second edition of the U.S. Dietary Goals, compute personal daily sodium intake for the past two to three days. Compare with the recommendation that salt intake be restricted to 5 grams a day or less (2 grams or 2000 milligrams sodium). Follow by brainstorming two lists of foods: those high in sodium and those lower in sodium. Summarize by developing generalizations about specific foods to avoid as well as other strategies one could use to reduce sodium intake (e.g., add little or no salt to food at the table, cook without salt, use lemon juice and spices to "pep up" flavors, read food labels carefully). One or more of the following activities could be used during additional sessions.

A. Identify and compare amounts of sodium which is hidden in foods and often unsuspected (e.g., corn flakes, canned seafood and vegetables, creamed soups, breaded foods, American versus cottage cheese).
B. Compare cost and acceptability of various brands of salt substitutes.
C. Identify various salt-free food products on the market and compare as to cost and acceptability.
D. Adapt favorite recipes so they are lower in sodium and/or sodium-free.
E. Plan weekly menus with different sodium levels (e.g., 2000 mg., 1000 mg.)
F. Plan weekly menus which would meet the needs of a family member who needs to restrict sodium intake but that would also be acceptable to other family members.
G. Identify ways family members can encourage another member to stay on a "doctor ordered" low-sodium diet.
H. Discuss possible dangers of diuretics when used with a very low sodium diet.

Focus: Food Allergies

Goal #8—To aid individuals with food allergies in creatively meeting nutrient needs while avoiding "prohibited" foods.

- Select one of more foods to which some persons are allergic or intolerant (e.g., milk, eggs, wheat). Using a Table of Food Composition,[19] identify the nutrients found in these foods and other foods which contain these same nutrients. Refer to the Recommended Dietary Allowance tables[20] to determine appropriate amounts of the nutrients needed and list alternative foods which could be eaten to obtain needed amounts of nutrients. Summarize by identifying specific nutrients which may be difficult to get in sufficient quantities if a major food is eliminated. Follow-up sessions may focus on one or more activities such as:

A. Identifying substitutes for allergy-related foods available on the market (e.g., "imitation" eggs and coffee creamers) and comparing cost and taste.
B. Planning menus that would appeal to different age groups and meet nutritional as well as dietary restriction requirements. For example:
   Case #1: Bill, a 15-year-old boy that cannot have milk or milk products.
   Case #2: Mrs. Marshall, a 42-year-old mother who cannot have wheat flour.
   Case #3: Mr. Smith, a 75-year-old man that cannot have milk or milk products.
   Case #4: Julie, a 7-year-old girl who cannot have eggs.
C. Identify, develop, modify, and/or share recipe suggestions for foods that do not contain allergy-related foods.[21]

SPECIAL EDUCATIONAL NEEDS

Goal #9—To enable the student to identify and select foods necessary for a nutritionally balanced diet.

- Using a large bulletin board divided into the major food groups, pin pictures of food into the appropriate categories. Then, keeping in mind the number of serving recommendations for each group, find pictures of food that could be:

A. Put into a picnic basket for a day in the park.
B. Served at a barbecue.
C. Served at a dinner birthday party.
D. Eaten for a quick and easy-to-fix breakfast.
E. Packed into a take-to-school lunch.

- To become familiar with the body's needs for the major nutrients and water, work in small group (3 to 5 students) learning centers to investigate the function of each nutrient and the types of foods which contain them. Activities in each center might include: picture illustrations of nutrient functions and food sources, word games (e.g., fill-in-the-blanks, crossword, word scramble) to aid vocabulary development, and flash cards and

jigsaw puzzles to reinforce concepts. Rotate time at each center until everyone has had a chance to sample all activities. Summarize learnings in a large group discussion.

- After learning about food groups as well as the concept of nutrient density (how some foods contain more nutrients than others), perhaps by viewing drawings of different foods sized according to nutrient value, expand understanding by completing one or more the the following activities:

1) Look through magazines to find pictures of foods from each of the food groups that would be richer and poorer in nutrients.
2) Visit a cafeteria and identify foods offered that would be better sources of nutrients than others.
3) Visit a local grocery store to identify foods there that would be good sources of nutrients and foods that would not.

Summarize findings by identifying similar foods found in different places. If possible, keep track of times when foods higher in nutrients were selected over those lower in nutrients.

- Think about foods that are often eaten between meals (snack foods) and find or draw pictures of them. Then separate the pictures into two groups, one for foods high in sugar content (e.g., candy bar, soda) and one for foods lower in sugar content (e.g., fruit, popcorn). Follow by thinking of other foods that are lower in sugar content that would make good snacks (e.g., nuts, vegetable sticks, fruit juice). Draw pictures of these to post on a bulletin board titled "Snack Ideas." If possible, practice preparing foods for one or more of these snacks and/or keep track of times snacks lower in sugar content were chosen over those higher in sugar content.

- Divide pieces of paper on which are written names of common food (in red letters for high calorie foods and blue letters for lower calorie foods) into two groups by color. If desired, find pictures of each of the foods. Identify characteristics the foods in each group have in common (e.g., high calorie—more fat and/or sugar, low calorie—less fat and/or sugar). Follow by discussing the relation between kinds of foods eaten, calorie intake, and body weight.

Selected Resources

Special Nutritional Needs

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Blakeslee, A. and J. Stamler. *Four Keys to a Healthy Heart* (1976). An overview of risk factors for heart disease available from Best Foods, International Plaza, Englewood Cliffs, NJ 07632.

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Footnotes

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[3]Cyborski, C.K., "Deaths Associated with the Protein-Sparing Diet—Questions and Answers," *Journal of the American Medical Association.* Vol. 239, 1978, p. 1971.

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